

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the U.S. Patent Application of: )  
 )  
 Inventor(s): Gilbreth et al. )  
 )  
 Serial No.: not assigned )  
 )  
 Filed : concurrently )  
 )  
 Examiner: not assigned )  
 )  
 Art Unit: 2834 )  
 )  
 For: AUTOMATIC TURBOGENERATOR )  
 RESTARTING SYSTEM AND METHOD )

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**PRELIMINARY AMENDMENT**

Assistant Commissioner for Patents  
 Washington, D.C. 20231

Sir:

This Preliminary Amendment is filed concurrently with the above-identified Divisional Application. Preliminary to examining the Application, please enter the following amendments.

IN THE CLAIMS

Please cancel original claims 1-36. A full set of all pending claims are presented here for the Examiner's convenience.

09900631-070604  
T09040-00900600

1 37. A permanent magnet turbogenerator/motor restarting  
2 system, comprising:  
3 means for determining that the permanent magnet  
4 turbogenerator/motor has a fatal fault present and is in the  
5 process of shutting down;  
6 means for determining that the permanent magnet  
7 turbogenerator/motor has more than a fixed number of restart  
8 attempts since the permanent magnet turbogenerator/motor was  
9 determined to have a fatal fault; and  
10 means to continue shutdown of the permanent magnet  
11 turbogenerator/motor.

1 38. A permanent magnet turbogenerator/motor restarting  
2 system, comprising:  
3 means for determining that the permanent magnet  
4 turbogenerator/motor has a fatal fault present and is in the  
5 process of shutting down;  
6 means for determining that the permanent magnet  
7 turbogenerator/motor has less than a fixed number of restart  
8 attempts since the permanent magnet turbogenerator/motor was  
9 determined to have a fatal fault;  
10 determining that the permanent magnet  
11 turbogenerator/motor is in a recharge state where an internal  
12 energy storage device is being recharged as part of the  
13 shutdown process;  
14 means for determining that a fixed period of time has  
15 elapsed since any previous attempt to restart the permanent  
16 magnet turbogenerator/motor;  
17 means to attempt to clear the fault present in the  
18 permanent magnet turbogenerator/motor;

19 means to issue a restart command to the permanent magnet  
20 turbogenerator/motor if the fatal fault is successfully  
21 cleared;

22 means to continue normal operation of the permanent  
23 magnet turbogenerator/motor.

1 39. A permanent magnet turbogenerator/motor restarting  
2 system, comprising:

3 means for determining that the permanent magnet  
4 turbogenerator/motor has a fatal present and is in the  
5 process of shutting down;;

6 means for determining that the permanent magnet  
7 turbogenerator/motor has less than a fixed number of restart  
8 attempts since the permanent magnet turbogenerator/motor was  
9 determined to have a fatal fault;

10 means for determining that the permanent magnet  
11 turbogenerator/motor is in a cooldown state where the  
12 turbogenerator/motor is being rotated when combustion has  
13 ceased to lower the internal temperature as part of the  
14 shutdown process and that the internal temperature is below a  
15 cooldown restart temperature;

16 means for determining that a fixed period of time has  
17 elapsed since any previous attempt to restart the permanent  
18 magnet turbogenerator/motor;

19 means to attempt to clear the fault present in the  
20 permanent magnet turbogenerator/motor;

21 means to issue a restart command to the permanent magnet  
22 turbogenerator/motor if the fatal fault is successfully  
23 cleared; and

24 means to continue normal operation of the permanent  
25 magnet turbogenerator/motor.

1 40. A permanent magnet turbogenerator/motor restarting  
2 system, comprising:

3 means for determining that the permanent magnet  
4 turbogenerator/motor has a fatal fault present and is in the  
5 process of shutting down;

6 means for determining that the permanent magnet  
7 turbogenerator/motor has less than a fixed number of restart  
8 attempts since the permanent magnet turbogenerator/motor was  
9 determined to have a fatal fault;

10 means for determining that the permanent magnet  
11 turbogenerator/motor is in a fault state;

12 means for determining that a fixed period of time has  
13 elapsed since any previous attempt to restart the permanent  
14 magnet turbogenerator/motor;

15 means to attempt to clear the fault present in the  
16 permanent magnet turbogenerator/motor;

17 means to issue a restart command to the permanent magnet  
18 turbogenerator/motor if the fatal fault is successfully  
19 cleared; and

20 means to continue normal operation of the permanent  
21 magnet turbogenerator/motor.

1 41. A permanent magnet turbogenerator/motor restarting  
2 system, comprising:

3 means for determining that the permanent magnet  
4 turbogenerator/motor has a fatal fault present and is in the  
5 process of shutting down;

6 means for determining that the permanent magnet:  
7 turbogenerator/motor has less than a fixed number of restart  
8 attempts since the permanent magnet turbogenerator/motor was  
9 determined to have a fatal fault;

10 means for determining that the permanent magnet  
11 turbogenerator/motor is in a standby state;  
12 means to issue a restart command to the permanent magnet  
13 turbogenerator/motor; and  
14 means to continue normal operation of the permanent  
15 magnet turbogenerator/motor.

1 42. A permanent magnet turbogenerator/motor restarting  
2 system, comprising:  
3 means for determining that the permanent magnet  
4 turbogenerator/motor has a fatal fault present and is in the  
5 process of shutting down;  
6 means for determining that the permanent magnet  
7 turbogenerator/motor has less than a fixed number of restart  
8 attempts since the permanent magnet turbogenerator/motor was  
9 determined to have a fatal fault;  
10 determining that the permanent magnet  
11 turbogenerator/motor is in a recharge state where an internal  
12 energy storage device is being recharged as part of the  
13 shutdown process;  
14 means for determining that a fixed period of time has  
15 not elapsed since any previous attempt to restart the  
16 permanent magnet turbogenerator/motor;  
17 means to continue shutdown of the permanent magnet  
18 turbogenerator/motor.

1 43. A permanent magnet turbogenerator/motor restarting  
2 system, comprising:  
3 means for determining that the permanent magnet  
4 turbogenerator/motor has a fatal fault present and is in the  
5 process of shutting down;

6 means for determining that the permanent magnet  
7 turbogenerator/motor has less than a fixed number of restart  
8 attempts since the permanent magnet turbogenerator/motor was  
9 determined to have a fatal fault;

10 means for determining that the permanent magnet  
11 turbogenerator/motor is in a cooldown state where the  
12 turbogenerator/motor is being rotated when combustion has  
13 ceased to lower the internal temperature as part of the  
14 shutdown process and that the internal temperature is below a  
15 cooldown restart temperature;

16 means for determining that a fixed period of time has  
17 elapsed since any previous attempt to restart the permanent  
18 magnet turbogenerator/motor;

19 means to attempt to clear the fault present in the  
20 permanent magnet turbogenerator/motor;

21 and

22 means to continue shutdown of the permanent magnet  
23 turbogenerator/motor when the fault is not cleared.

1 44. A permanent magnet turbogenerator/motor restarting  
2 system, comprising:

3 means for determining that the permanent magnet  
4 turbogenerator/motor has a fatal fault present and is in the  
5 process of shutting down.

6 means for determining that the permanent magnet  
7 turbogenerator/motor has less than a fixed number of restart  
8 attempts since the permanent magnet turbogenerator/motor was  
9 determined to have a fatal fault;

10 means for determining that the permanent magnet  
11 turbogenerator/motor is in a fault state;

12 means for determining that a fixed period of time has  
13 elapsed since any previous attempt to restart the permanent  
14 magnet turbogenerator/motor;

15 means to attempt to clear the fault present in the  
16 permanent magnet turbogenerator/motor; and

17 means to continue shutdown of the permanent magnet  
18 turbogenerator/motor when the fault is not cleared.

1 45. The permanent magnet turbogenerator/motor  
2 restarting system of claim 44 wherein said means for  
3 determining that the permanent magnet turbogenerator/motor  
4 has a fatal fault present and is in the process of shutting  
5 down, comprises:

6 means for detecting no output over-current;

7 means for detecting a loss of output current control or  
8 a loss of DC bus voltage control;

9 means for determining that less than a fixed number of  
10 warning faults has occurred within a fixed period of time;

11 means for reporting a grid unbalance warning fault;

12 means for disabling the output power converter of the  
13 permanent magnet turbogenerator/motor;

14 means for analyzing the grid voltage magnitude and  
15 frequency for an unacceptable connection;

16 means for determining that the maximum allowable  
17 reconnection time has not expired;

18 means for determining that the DC bus level is not below  
19 the turn on point of the brake resistor,

20 means for applying the brake resistor to control DC bus  
21 voltage;

22 means for determining that the grid is acceptable for  
23 connection; and

24 means for enabling the output power converter of the  
25 permanent magnet turbogenerator/motor to continue normal  
26 operation of the permanent magnet turbogenerator/motor.

REMARKS

This is a Divisional Application of serial no.  
09/444,487 filed on November 19, 1999. In the original  
application, restriction to one of the following inventions  
was required under 35 U.S.C. 121.

I. Claims 1-23, drawn to a method of restarting a turbo-  
generator.

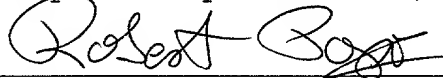
II. Claims 24-36, drawn to a method of fault detection.

III. Claims 37-45, drawn to a permanent magnet turbo-  
generator/motor restarting system.

A provisional election was made without traverse to  
prosecute the invention of Group I, claims 1-23. Claims 24-45  
were canceled by Examiner's amendment.

In this application, the invention of Group III  
consisting of claims 37-45 is presented. In a separate  
divisional filed concurrently, the claims directed to  
invention of Group II are submitted. No new matter has been  
introduced by this Preliminary Amendment.

Respectfully Submitted,



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